

Report from the 4th meeting of 1st year PhD students of Interdisciplinary Polar Studies

Sosnowiec / Korbielów, 18-22 January 2016

The next meeting of Interdisciplinary Polar Studies took place in Faculty of Earth Sciences in University of Silesia. Programme of IV meeting envisions 3-days field workshop in Beskidy Mountains (Pilsko, Korbielów). Details of this meeting are accessible in http://www.polarknow.us.edu.pl/wp-content/uploads/ISP_workshop-schedule_18-22_01_2016.pdf.

On the first day a theoretical introduction to problem of geophysics took place. Dr. hab. Adam Idziak prof. of Silesian University UŚ gave a speech in which he presented a base of applied geophysics and described the methods used in geophysical research. Thereafter he continued the lecture “Seismics and electromagnetics in environmental applications” where practical application of geophysics methods in environment research was being discussed.

Next speech “Radio-echo soundings in glaciology“ was performed by Dr. Javier Lapazaran from Technical University of Madrid (member of Group of Numerical Simulation in Science and Engineering). In this case problem concerned: a base of radar waves propagation, operation of Ground Penetrating Radar and range of its activity in polar environment. Moreover, Dr. J. Lapazaran discussed structure and physical properties of glaciers. The last speech on this day was performed by prof. dr. Zdeněk Kaláb – the chairman of Czech Association of Geophysicists (CAAG). The theme of the lecture was “Geophysical survey for glacial and other deposits” in which prof. Z. Kaláb discussed the issues of cryosphere and presented the characteristics of geological profiles in different deposits types, particularly in glacial sediments. In this case the application of geophysics methods (especially seismic) in fields was discussed as well.

In the evening all participants of 4th meeting were carried to Korbielów (Jontek Hotel), where during 3 next days they performed field workshops.

Field session was divided into 3 parts: ground penetrating radar, electroresistivity and seismic. In this case after field measurements all data had been worked out in sufficient software. First (GPR) part concerned “Application of high and low frequency radar sounding”, “Reflection radio-echo soundings of deep structures” and “Radar soundings of shallow structures“ which dr. Mariusz Grabiec hosted together with dr. J. Lapazaran. The first thing, the lecturers discussed about, were the conditions and possibilities to perform research and they explained schema of RAMAC/GPR construction, useful to perform a radar probing. Then, all PhD students with guardians left a lecture room so that to execute measurements outside. In this order we used different types of antenna (high and low frequency). After measurements our teachers explained us the base of using software to analysis GPR data (GroundVision -Mala Geosciences) and we interpreted the results.



Fot. 1st year PhD students of Interdisciplinary Polar Studies during GPR measurements in Korbielów (photo: Aleksander Uszczyk)

Next subject concerned measurements of electro resistivity given by Dr. Marta Kondracka who specified a few types of this measurements (Resistivity Soundings - SE, Resistivity Profiling – PE, and Electrical Resistivity Tomography - ERT). After a short introduction and field measurements where electroresistivity images were performed, we joined to interpret our data. Dr. Marta Kondracka discussed the base of definition concerning electro resistivity research (e.g.: actual and apparent resistivity) and then she explained function of Res2D Inv (GeoTomo) software. This software allow us to visualizedata in two dimensions.

Another subject in field session concerned seismic refraction “Practical aspects of seismics” and was performed by Dr. Iwona Stan-Kłeczek and prof. dr. Zdeněk Kaláb. After a brief introduction of the types of seismic waves and the factors affecting these waves speed, we discussed about different types of equipment used for seismic exploration. Then we went to the field measurements. At the end of the day Dr. Iwona Stan-Kłeczek and prof. dr. Zdeněk Kaláb led the exercises with the processing of seismic data. Due to using Pickwin and Plotrefa software we created a model of measured medium and then we obtained the seismic tomography. The course in field session was ended after the common interpretation our results.



Fot. 1st year PhD students of Interdisciplinary Polar Studies during Seismics measurements performed by Dr. Iwona Stan-Kleczek and prof. dr. Zdeněk Kaláb in Korbielów (photo: Leo Decaux)

Next day started in Faculty of Earth Sciences by lecture of Dr. hab. Wojciech Dobiński and concerned “Application of geophysics in periglacial environment”. One type of supplement was the last lecture “Geophysical methods in glaciology and periglacial environment” given by Dr. Marta Kondracka.

The fourth meeting 1st year PhD students of Interdisciplinary Polar Studies ended after 5 days. The thanks and summary of the meeting took place after all lectures in Faculty of Earth Sciences in Sosnowiec.

mgr inż. Aleksander Uszczyk